Claims:

1. A method for preparing a fuel cell composite bipolar plate, which comprises:

a) compounding a mixture comprising a graphite powder and a vinyl ester resin to form a homogeneous bulk molding compound material, wherein said material comprises 60 to 80 wt% of said graphite powder, based on the weight of said material;

b) molding the material from step a) to form a bipolar plate having a desired shape at 80-200°C and 500-4000 psi;

wherein particles of said graphite powder have a size of 10-80 mesh.

2. The method as claimed in Claim 1, wherein less than 10 wt% of the particles of the graphite powder are larger than 40 mesh, and the remaining particles of the graphite powder have a size of 40-80 mesh.

3. The method as claimed in Claim 1, wherein said mixture in step (a) further comprises a free radical initiator in an amount of 1-10% based on the weight of said vinyl ester resin.

4. The method as claimed in Claim 3, wherein said free radical initiator is selected from the group consisting of peroxide, hydroperoxide, azonitrile, redox systems, persulfates, and perbenzoates.

5. The method as claimed in Claim 4, wherein said free radical initiator is t-butyl peroxybenzoate.

6. The method as claimed in Claim 1, wherein said mixture in step a)

further comprises a mold releasing agent in an amount of 1-10%, based on the weight of said vinyl ester resin.

7. The method as claimed in Claim 6, wherein said mold releasing agent is wax or metal stearate.

8. The method as claimed in Claim 7, wherein said mold releasing agent is metal stearate.

9. The method as claimed in Claim 1, wherein said mixture in step a) further comprises a low shrinking agent in an amount of 5-20%, based on the weight of said vinyl ester resin.

10. The method as claimed in Claim 9, wherein said low shrinking agent is selected from the group consisting of styrene-monomer-diluted polystyrene resin, copolymer of styrene and acrylic acid, poly(vinyl acetate), copolymer of vinyl acetate and acrylic acid, copolymer of vinyl acetate and itaconic acid, and terpolymer of vinyl acetate, acrylic acid and itaconic acid.

11. The method as claimed in Claim 10, wherein said low shrinking agent is styrene-monomer-diluted polystyrene resin.

12. The method as claimed in Claim 1, wherein said mixture in step a) further comprises a tackifier in an amount of 1-10%, based on the weight of said vinyl ester resin.

13. The method as claimed in Claim 12, wherein said tackifier is

selected from the group consisting of alkaline earth metal oxides, alkaline earth metal hydroxides, carbodiamides, aziridines, and polyisocyanates.

14. The method as claimed in Claim 13, wherein said tackifier is calcium oxide or magnesium oxide.

15. The method as claimed in Claim 1, wherein said mixture in step a) further comprises a solvent in an amount of 10-35%, based on the weight of said vinyl ester resin.

16. The method as claimed in Claim 15, wherein said solvent is selected from the group consisting of styrene monomer, alpha-methyl styrene monomer, chloro-styrene monomer, vinyl toluene monomer, divinyl toluene monomer, diallylphthalate monomer, and methyl methacrylate monomer.

17. The method as claimed in Claim 16, wherein said solvent is styrene monomer.

18. The method as claimed in Claim 1, wherein said vinyl ester is selected from the group consisting of bisphenol-A epoxy-based methacrylate, bisphenol-A epoxy-based acrylate, tetrabromo bisphenol-A epoxy-based methacrylate, and phenol-novolac epoxy-based methacrylate.

19. The method as claimed in Claim 1, wherein said vinyl ester resin has a molecular weight of 500-10000.

20. The method as claimed in Claim 18, wherein said vinyl ester resin is phenol-novolac epoxy-based methacrylate.